Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1 (currently amended) A method of evaluating a feature in a semiconductor wafer, the method comprising:

illuminating the wafer with a beam of electromagnetic radiation having a majority of energy polarized in a selected direction, said selected direction being other than parallel to a longitudinal direction of the feature, wherein the wafer comprises a layer located between a source of the beam and the feature, the layer is at least partially transmissive, so that a portion of the beam passes through the layer, and the layer is thermally conductive; and

measuring [intensity of a portion of the beam reflected by the wafer] a change in reflectance of the feature due to heat transfer therethrough caused by illumination with the beam.

2 (original) The method of Claim 1 wherein:

the feature includes a sidewall of a groove; and

the act of measuring is performed repeatedly at a plurality of locations transverse to the longitudinal direction of the groove.

3 (original) The method of Claim 2 wherein:

the beam has a wavelength greater than thickness of the sidewall.

4 (original) The method of Claim 1 wherein:

the beam has a wavelength greater than a dimension of the feature; and

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

the beam forms on the wafer a spot of a diameter greater than the dimension.

5 (original) The method of Claim 1 wherein:

the feature includes a trace of reflective material.

Claim 6 (canceled).

7 (currently amended) The method of Claim 1 wherein:

[the beam has a majority of energy polarized in a] the selected direction is at least substantially perpendicular to the longitudinal direction.

8 (original) The method of Claim 1 wherein:

the beam has a predetermined wavelength; and

the method further comprises filtering light of a wavelength other than the predetermined wavelength.

9 (original) The method of Claim 1 wherein the wafer has a plurality of features including the feature, and the method further comprises:

performing the act of measuring for each feature of the plurality; and

comparing measurements of multiple features.

10 (original) The method of Claim 9 wherein:

each feature is a sidewall; and

the act of comparing includes comparing measurements of two sidewalls located opposite to one another in a groove.

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

11 (original) The method of Claim 1 wherein the beam is a first beam, and the method further comprises:

illuminating the wafer with a second beam of electromagnetic radiation.

12 (original) The method of Claim 11 wherein:

the first beam forms a first spot on the wafer, the second beam forms a second spot;

the act of measuring includes measuring with the first spot and the second spots located on opposite sides of the feature; and

the method further comprises measuring with the first spot and the second spots located on the same side of the feature.

13 (original) The method of Claim 11 wherein:

the second spot at least partially overlaps the first spot.

14 (original) The method of Claim 13 wherein:

the first beam has a first wavelength different from a second wavelength of the second beam;

the second beam is modulated at a predetermined frequency; and

the act of measuring includes measuring intensity of the second beam having the second wavelength and modulated at the predetermined frequency.

15 (original) The method of Claim 13 wherein:

the first beam is polarized substantially perpendicular to the longitudinal direction.

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

16 (previously presented) The method of Claim 1 further comprising:

forming the feature of conductive material in the wafer by using at least one process parameter;

repeatedly performing said measuring intensity; and

changing the process parameter depending on measurements obtained from the act of repeatedly measuring.

17 (previously presented) A method of evaluating wafers during fabrication, the method comprising:

forming a feature of conductive material in a wafer by using at least one process parameter;

illuminating the wafer with a beam of electromagnetic radiation having a majority of energy polarized in a direction other than parallel to a longitudinal direction of the feature; and

repeatedly measuring intensity of a portion of the beam reflected by the wafer at a plurality of locations transverse to the longitudinal direction;

changing the process parameter depending on measurements obtained from the act of repeatedly measuring;

determining a coefficient of a function that fits the measurements;

comparing the coefficient against a predetermined limit and performing the changing based on an outcome of the comparing.

Claims 18-28 (canceled).

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

29 (previously presented) An apparatus for evaluating a feature in a wafer, the apparatus comprising:

a laser source for generating a beam polarized in a direction, wherein said direction is other than parallel to a longitudinal direction of the feature; and

a photosensitive element located in a path of radiation of electromagnetic energy from the wafer.

30 (original) The apparatus of Claim 29 further comprising:

a circuit coupled to the laser to move the beam along a line across the feature; and

a monitor for displaying a graph of a signal generated by the photosensitive element as a function of distance along the line.

31 (original) The apparatus of Claim 30 wherein:

the line is at least substantially perpendicular to the longitudinal direction of the feature.

32 (original) The apparatus of Claim 29 further comprising:

an oscillator capable of oscillating at a frequency lower than 25000 Hz, the oscillator being coupled to the laser source; and

a lock-in amplifier coupled to said oscillator and to said photosensitive element.

33 (original) The apparatus of Claim 32 wherein during operation:

said oscillator causes said laser source to generate said beam at an intensity modulated at said frequency; and

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

said lock-in amplifier generates a signal indicative of ref1ectivity of said wafer.

34 (original) The apparatus of Claim 29 further comprising:

a computer coupled to the photosensitive element and programmed to determine a

dimension of the feature.

35 (original) The apparatus of Claim 34 further comprising:

a memory having encoded therein values generated from at least one test wafer having a feature of a known property;

wherein the computer is programmed to use a signal generated by the photosensitive element to look up a value of property for the wafer, based on the values in memory.

36 (previously presented) An apparatus comprising:

means for illuminating a semiconductor wafer with a beam of electromagnetic radiation having a majority of energy polarized in a direction, wherein said direction is other than parallel to a longitudinal direction of the feature; and

means for measuring intensity of a portion of the beam reflected by the wafer, the means for measuring being coupled to the means for illuminating.

37 (original) The apparatus of Claim 36 further comprising:

means for displaying measurements generated by the means for measuring, as a function of distance.

38 (previously presented) The method of Claim 17 wherein:

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

the feature includes a sidewall of a groove.

39 (previously presented) The method of Claim 38 wherein:

the beam has a wavelength greater than thickness of the sidewall.

40 (previously presented) The method of Claim 17 wherein:

the beam has a wavelength greater than a dimension of the feature; and

the beam forms on the wafer a spot of a diameter greater than the dimension.

41 (previously presented) The method of Claim 17 wherein:

the feature includes a trace of reflective material.

42 (previously presented) The method of Claim 17 wherein:

the wafer includes a layer located between a source of the beam and the feature; and

the layer is at least partially transmissive, so that the portion passes through the layer.

43 (previously presented) The method of Claim 17 wherein:

the beam has a predetermined wavelength; and

the method further comprises filtering light of a wavelength other than the predetermined wavelength.

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

44 (previously presented) The method of Claim 17 wherein the wafer has a plurality of features including the feature, and the method further comprises:

performing the act of measuring for each feature of the plurality; and

comparing measurements of multiple features.

45 (previously presented) The method of Claim 17 wherein the beam is a first beam, and the method further comprises:

illuminating the wafer with a second beam of electromagnetic radiation.

46 (previously presented) The method of Claim 45 wherein:

the first beam forms a first spot on the wafer, the second beam forms a second spot;

the act of measuring includes measuring with the first spot and the second spots located on opposite sides of the feature; and

the method further comprises measuring with the first spot and the second spots located on the same side of the feature.

47 (previously presented) The method of Claim 46 wherein:

the second spot at least partially overlaps the first spot.

48 (previously presented) A method of evaluating a groove in a semiconductor wafer, the method comprising:

illuminating the wafer with a beam of light polarized in a direction P, said direction P forming an angle θ with a longitudinal direction of the groove, with angle $\theta > 45°$;

wherein the beam has a wavelength larger than a width of the groove, the groove is formed of a highly reflective material, and the groove has a first sidewall, a second sidewall and a floor between the first sidewall and the second sidewall;

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

heating of the groove by a portion of the light polarized perpendicular to the groove, heat from said heating being transmitted into a substrate of the semiconductor wafer; and

measuring intensity of light reflected by the wafer, wherein light absorbed in the groove measurably reduces the reflected light.

49 (previously presented) The method of Claim 48 wherein:

using a measurement obtained from said measuring as an indication of a thickness of the sidewall.

50 (previously presented) The method of Claim 48 wherein:

with angle θ is approximately 90°.

51 (previously presented) The method of Claim 50 wherein:

said light reflected by the wafer is part of said beam.

52 (previously presented) The method of Claim 50 wherein:

said light reflected by the wafer is part of another beam.

53 (New) The method of Claim 1 wherein:

said layer is metallic.

54 (New) The method of Claim 1 wherein:

said layer comprises copper.

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

55 (New) The method of Claim 1 wherein:

said layer comprises tantalum.

56 (New) The method of Claim 1 wherein:

said layer comprises a barrier layer.

57 (New) The method of Claim 1 wherein:

said layer comprises a seed layer.

58 (New) The method of Claim 17 wherein:

said conductive material comprises copper.

59 (New) The method of Claim 17 wherein:

said conductive material comprises tantalum.

60 (New) The method of Claim 17 wherein:

said conductive material forms a barrier layer during wafer fabrication.

61 (New) The method of Claim 17 wherein:

said conductive material forms a seed layer during wafer fabrication.

62 (New) The method of Claim 17 wherein:

said conductive material is metallic.

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210

63 (new) A method of evaluating a feature in a semiconductor wafer, the method comprising:

illuminating the wafer with a beam of electromagnetic radiation having a majority of energy polarized in a selected direction, said selected direction being substantially perpendicular to a longitudinal direction of the feature, wherein the wafer comprises a thermally conductive layer located between a source of the beam and the feature; and

measuring intensity of a portion of the beam reflected at least by the thermally conductive layer.

64 (New) The method of Claim 63 wherein:

said thermally conductive layer comprises a barrier layer.

65 (New) The method of Claim 63 wherein:

said thermally conductive layer comprises a seed layer.

SILICON VALLEY
PATENT GROUP LLP

2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210